

WHAT IS CLAIMED:

1. A gaseous fuel management system for an automotive vehicle having a passenger cabin and a prime mover, with said fuel management system comprising:

a gaseous fuel storage tank;
a fuel line for conveying gaseous fuel from said storage tank to said prime mover, with said fuel line having at least one electronically controlled valve for controlling the flow of gaseous fuel in the fuel line;
at least one gas sensor for detecting the presence of gaseous fuel outside of the confines of at least one of said storage tank, said fuel line, and said prime mover, with said sensor emitting a gas detection signal in the event that a concentration of fuel gas above a predetermined threshold level is detected;
a fuel management controller operatively connected with said electronically controlled valve and said gas sensor, with said controller closing said electronically controlled valve in the event that said gas sensor emits a gas detection signal.
2. A gaseous fuel management system according to Claim 1, wherein said prime mover comprises an internal combustion engine.
3. A gaseous fuel management system according to Claim 1, wherein said prime mover comprises an a fuel cell.
4. A gaseous fuel management system according to Claim 1, further comprising at least one atmospheric circulator operated by said fuel management controller in response to a gas detection signal from said gas sensor.

5. A gaseous fuel management system according to Claim 1, wherein said fuel management controller opens at least one window in said passenger cabin in response to a gas detection signal from said gas sensor.
6. A gaseous fuel management system according to Claim 1, wherein said at least one window comprises a moon roof in said passenger cabin.
7. A gaseous fuel management system according to Claim 1, wherein said prime mover comprises an internal combustion engine, with said fuel management controller placing and maintaining said electronically controlled valve in a closed position in the event that said gas detection signal is present.
8. A gaseous fuel management system according to Claim 1, wherein said prime mover comprises an internal combustion engine coupled to a traction motor/generator and to a transmission.
9. A gaseous fuel management system according to Claim 8, wherein said fuel management controller prevents recharging of said traction battery in the event that said gas detection signal is present.
10. A gaseous fuel management system according to Claim 8, wherein said fuel management controller not only closes said electronically controlled valve in the event that said gas detection signal is present, but also permits said vehicle to continue operating with said traction motor/generator.
11. A gaseous fuel management system according to Claim 1, wherein said gaseous fuel comprises hydrogen.
12. A gaseous fuel management system according to Claim 1, wherein said gaseous fuel comprises natural gas.

13. A gaseous fuel management system according to Claim 1, wherein said gaseous fuel comprises liquefied petroleum gas.
14. A gaseous fuel management system according to Claim 1, further comprising a warning system for alerting a driver of said vehicle in the event that a gas detection signal is present.
15. A gaseous fuel management system according to Claim 1, wherein said at least one gas detection sensor is located inside an enclosure within which said fuel storage tank is mounted.
16. A gaseous fuel management system according to Claim 1, wherein said at least one gas detection sensor is located within a compartment within which said prime mover is located.
17. A gaseous fuel management system according to Claim 1, wherein said at least one gas detection sensor is located within said passenger cabin.
18. A gaseous fuel management system according to Claim 8, wherein said at least one gas detection sensor is located within an enclosure within which said traction battery is located.
19. A gaseous fuel management system according to Claim 1, further comprising at least one ventilation duct having a first end connected to an enclosure within which said fuel storage tank is mounted and a second end connected to an air extractor mounted to an external surface of said automobile, whereby any gaseous fuel entering said enclosure from said fuel storage tank will be extracted from said enclosure.
20. A gaseous fuel management system according to Claim 1, further comprising at least one ventilation aperture formed in an upper portion of a compartment

within which said prime mover is located, whereby any gaseous fuel entering said compartment from said prime mover will be extracted from said enclosure.

21. An automotive vehicle, comprising:

a passenger cabin;

a prime mover comprising an internal combustion engine; and

a fuel management system comprising:

a gaseous fuel storage tank mounted within an enclosure having at least one atmospheric circulator associated therewith;

a fuel line for conveying gaseous fuel from said storage tank to said prime mover, with said fuel line having at least one electronically controlled valve for controlling the flow of gaseous fuel in the fuel line;

at least one gas sensor for detecting the presence of gaseous fuel outside of the confines of at least one of said storage tank, said fuel line, and said prime mover, with said sensor emitting a gas detection signal in the event that a concentration of fuel gas above a predetermined threshold level is detected; and
a fuel management controller operatively connected with said electronically controlled valve and said gas sensor, with said controller closing said electronically controlled valve and operating said at least one atmospheric circulator so as to ventilate said fuel storage tank enclosure in the event that said gas sensor emits a gas detection signal.

22. An automotive vehicle, comprising:

a passenger cabin;

a prime mover comprising an internal combustion engine coupled to at least a traction motor/generator; and

a fuel management system comprising:

a gaseous fuel storage tank mounted within an enclosure having at least one atmospheric circulator associated therewith;

a fuel line for conveying gaseous fuel from said storage tank to said prime mover, with said fuel line having at least one electronically controlled valve for controlling the flow of gaseous fuel in the fuel line;

at least one gas sensor for detecting the presence of gaseous fuel outside of the confines of at least one of said storage tank, said fuel line, and said prime mover, with said sensor emitting a gas detection signal in the event that a concentration of fuel gas above a predetermined threshold level is detected;

a fuel management controller operatively connected with said electronically controlled valve and said gas sensor, with said controller disabling said engine by closing said electronically controlled valve and operating said at least one atmospheric circulator so as to ventilate said fuel storage tank enclosure, while permitting continued operation of said vehicle with said traction motor/generator, in the event that said gas sensor emits a gas detection signal indicating a concentration of fuel gas in excess of a predetermined threshold.

23. An automotive vehicle according to Claim 22, further comprising a plurality of movable glazing panels mounted to said passenger compartment and controlled by said fuel management controller such that said glazing panels are opened in the event that said gas sensor emits a gas detection signal.
24. A method of operating a gaseous fueled automotive vehicle having both a prime mover fueled by said gaseous fuel, and a traction motor/generator, comprising the steps of:

providing a passive ventilation system to mitigate any significant buildup of fugitive fuel gas emissions within said vehicle;

monitoring at least one interior space of said vehicle, so as to determine the presence of fugitive fuel gas within said space, by means of at least one electronic gas sensor;

providing at least one atmospheric circulator for supplying ambient air to said least one space within said vehicle; and

disabling operation of said prime mover, while allowing operation of said traction motor/generator, and operating said at least one atmospheric circulator so as to purge said at least one interior space of fugitive fuel gas, in the event that fugitive gas is sensed while said vehicle is in operation.

25. A method according to Claim 24, further comprising the step of opening movable glazing in a passenger compartment of said vehicle in the event that fugitive fuel gas is sensed.
26. A method according to Claim 24, the disabling of said prime mover comprises at least the step of closing a fuel supply valve located between a gaseous fuel storage tank and said prime mover.
27. A method according to Claim 24, further comprising the step of preventing said vehicle from being refueled in the event that fugitive gas is sensed within said at least one interior space.
28. A method according to Claim 24, further comprising the step of disabling operation of said prime mover, while allowing operation of said traction motor/generator, and operating said at least one atmospheric circulator so as to purge said at least one interior space, in the event that said electronic gas sensor becomes inoperative.
29. A method according to Claim 24, wherein said at least one atmospheric circulator is operated at in the event that fugitive fuel gas exceeding a first, lower, predetermined concentration is sensed, with said prime mover being disabled in the further event that fugitive fuel gas exceeding a second, higher, predetermined concentration is sensed.

30. A method according to Claim 24, further comprising the step of warning a driver of the vehicle in the event that fugitive fuel gas is detected at a concentration above a predetermined threshold concentration.